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INSPECTION OF COMMERCIAL FERTILIZERS

MADE FOR THE STATE DEPARTMENT OF AGRICULTURE

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Andrew L. Felker, Commissioner of Agriculture. The state inspector, Mr. Eugene D. Sanborn, collected samples of 108 brands of fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1933. The general character of the fertilizer materials collected is shown by the following classification:

Complete fertilizer	86
Superphosphate (acid phosphate)	5
Nitrate of soda	1
Sulphate of ammonia	1
Cyanamid	1
Ground bone	3
Tankage	1
Natural manures	10
	108

CHANGES IN THE FERTILIZER LAW

The Legislature of 1933 enacted two important changes in the fertilizer law. Section 1 has been amended to read as follows: Labeling. Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed

for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package, the name, brand or trademark under which the fertilizer is sold, the name and address of the manufacturer or importer, the location of the factory, and a chemical analysis stating the minimum percentage of nitrogen, of water soluble potash and of available phosphoric acid expressed in whole numbers.

The following new section 1-a has been enacted: No fertilizer or fertilizer material containing the three essential fertilizing elements nitrogen, potash and phosphoric acid may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section.

The chief purpose of the fertilizer law is to protect the consumer against the low grade products which would doubtless soon appear upon the market if the distribution and sale of fertilizer was not under state regulation. The value of a fertilizer depends on its content of available plant food, i. e., nitrogen, phosphoric acid and potash. The presence of these constituents can only be determined by a chemical analysis. To insure that these constituents are being furnished by the manufacturer in guaranteed amounts it is necessary that each brand of fertilizer offered for sale be officially inspected and analyzed one or more times each year. When failure to meet the guarantee is proven by chemical analysis the prosecution or seizure provisions of the law may be invoked. The state official charged with the administration of the fertilizer law is the Commissioner of Agriculture. All inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office in Concord.

In Table I are given the grades of complete fertilizers analyzed in this year's inspection, the number of brands found in each grade, the average analysis of each grade and the average retail price per ton.

TABLE I

Formula	Number of brands	Average per cent nitrogen	Average per cent total phosphoric acid	Average per cent available phosphoric acid	Average per cent water soluble potash	Average retail price per ton
2—8—10	1	2.48	8.88	8.34	10.26	$37.00
2—10—2	6	2.28	10.85	10.29	2.15	28.16
2—12—4	3	2.22	12.73	11.97	4.15	34.32
3—10—4	6	3.17	10.85	10.46	3.90	34.06
3—10—6	1	3.25	10.66	10.09	6.37	30.00
4—4—0	1	4.34	12.84	9.54	0.00	76.00
4—8—4	12	4.13	8.84	8.40	4.07	30.70
4—8—7	5	4.07	8.89	8.50	7.01	33.76
4—8—8	1	4.45	8.76	8.39	8.98	31.00
4—8—10	13	4.10	8.73	8.35	9.79	39.66
4—10—5	1	3.85	10.11	9.68	5.56	38.00
4—10—6	1	4.41	10.71	10.50	7.20	31.00
4—12—4	2	4.18	13.14	12.52	4.28	65.50
5—8—6	1	5.35	11.44	9.54	6.59	140.00
5—8—7	12	5.11	9.01	8.42	6.97	37.00
5—8—10	1	5.36	8.33	8.03	10.00	45.00
5—10—4	1	5.03	11.07	10.27	4.04	100.00
5—16—7	1	5.00	16.36	15.19	7.14	36.00
6—8—6	1	6.38	9.02	8.58	6.61	33.40
7—6—6	5	7.14	6.59	6.42	5.97	40.24
7—8—5	1	6.69	9.25	8.71	5.03	31.00
8—5—8	1	8.02	9.05	7.18	8.00	52.00
8—6—2	1	8.13	7.08	6.86	2.26	50.00
8—16—14	3	8.07	17.09	16.65	14.22	47.12
8—16—16	1	8.23	17.62	17.32	16.90	50.80
8—24—8	1	8.68	25.32	24.89	9.65	53.60
15—20—15	1	15.02	20.20	20.17	15.00	69.20
18—6—6	1	17.58	7.07	7.07	7.03	54.40

CONFORMITY TO GUARANTEE

Seventy-nine of the 108 brands analyzed equalled or exceeded the guarantees. Twenty-nine brands contained less than the guaranteed amount of one or more of the three constituents, nitrogen, available phosphoric acid and water soluble potash. No brand was found deficient in all three constituents.

A detailed summary of the deficiencies follows:

	Number of Brands	Total Deficiencies
Nitrogen and available phosphoric acid	1	2
Nitrogen and potash	4	8
Nitrogen	5	5
Potash	14	14
Total phosphoric acid	2	2
Available phosphoric acid	3	3
	29	34

The total per cent of plant food nutrients guaranteed was less than the total per cent found in only five brands. Ten samples were deficient in nitrogen. Five of these brands were deficient less than 3 pounds of nitrogen per ton. One was deficient 8 pounds per ton and one was deficient 12.8 pounds per ton. The greatest deficiency is equivalent to about $1.50 per ton, assuming the nitrogen present in the inorganic form and making no allowance for overrun in the other constituents which in this brand amounts to about $1.00 per ton.

Only four samples were deficient in available phosphoric acid. Three of these deficiencies amount to less than fifty cents per ton and the maximum deficiency less than $1.00 per ton.

There were eighteen samples deficient in potash. Sixteen of these deficiencies amount to less than fifty cents per ton. One was less than $1.00 per ton. One deficiency was nearly $2.00 per ton although overages in nitrogen and available phosphoric acid make up one-half the deficiency.

In the tabulation of the analyses in the following pages deficiencies of one-fourth of one per cent or more of nitrogen and one-half of one per cent or more of available phosphoric acid and water soluble potash are shown in

bold-faced type. A deficiency of more than one-half of one per cent in the total plant nutrients guaranteed is also shown in bold-faced type. The names of the manufacturers are arranged alphabetically, and under the manufacturer the different brands are arranged alphabetically or numerically by formula.

	Nitrogen		Phosphoric Acid				Potash		Total Per Cent	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Agricultural Chemical Co. New York City, N. Y.										
AA Aroostook Potato Manure 5-8-7	5.00	5.15	.....	8.94	8.00	8.74	7.00	7.00	20.00	20.89
AA Complete Manure with 10% Potash 4-8-10	4.00	4.03	.....	8.63	8.00	8.39	10.00	9.61	22.00	22.03
AA Corn Favorite 3-10-4	3.00	3.15	.....	10.31	10.00	10.04	4.00	4.03	17.00	17.22
AA Double Strength Fertilizer 8-16-14	8.00	8.00	.....	17.07	16.00	16.57	14.00	14.38	38.00	38.95
AA Monarch 4-8-4 Fertilizer	4.00	3.96	.....	8.58	8.00	8.21	4.00	3.86	16.00	16.03
AA Peerless 4-8-7 Fertilizer	4.00	4.19	.....	8.63	8.00	8.29	7.00	7.03	19.00	19.51
AA Superphosphate 16%	.....	.....	.....	17.63	16.00	16.93	.....	.....	.....	.....
AA Top Dresser 7-6-6	7.00	7.30	.....	6.65	6.00	6.38	6.00	6.00	19.00	19.68
Agrico for Aroostook with 10% Potash 5-8-10	5.00	5.36	.....	8.33	8.00	8.03	10.00	10.00	23.00	23.39
Agrico for Corn 3-10-6	3.00	3.25	.....	10.66	10.00	10.09	6.00	6.37	19.00	19.71
Agrico for Lawns, Trees, and Shrubs 7-6-6	7.00	7.48	.....	6.66	6.00	6.42	6.00	5.73	19.00	19.63
Agrico for New England 4-8-10	4.00	3.86	.....	8.27	8.00	8.04	10.00	9.64	22.00	21.54
Agrico for Truck 4-10-5	4.00	3.85	.....	10.11	10.00	9.68	5.00	5.56	19.00	19.09
Bowker's Farm and Garden Phosphate 2-10-2	2.00	2.18	.....	10.94	10.00	10.45	2.00	2.00	14.00	14.63
Bowker's Market Garden Fertilizer 4-8-4	4.00	4.00	.....	8.62	8.00	8.25	4.00	4.02	16.00	16.27
Bowker's Stockbridge Early Crop Manure 5-8-7	5.00	4.86	.....	8.51	8.00	8.31	7.00	7.00	20.00	20.17

Bowker's Stockbridge Potato and Vegetable Manure 4-8-10	4.00	4.51	.....	8.27	8.00	8.00	10.00	10.00	22.00	22.51
Bradley's XL 3-10-4 Fertilizer	3.00	3.29	.....	10.84	10.00	10.56	4.00	4.00	17.00	17.85
Bradley's Complete Manure with 10% Potash 4-8-10	4.00	4.33	.....	8.58	8.00	8.26	10.00	10.12	22.00	22.71
Bradley's Eclipse Fertilizer 2-10-2	2.00	2.06	.....	10.65	10.00	10.07	2.00	2.00	14.00	14.13
Pulverized Sheep and Goat Manure	1.23	1.40	1.00	0.89	.....	0.84	2.00	2.00	.....	.....
American Cyanamid Co. Niagara Falls, Canada										
G. C. Aero Cyanamid Granular	22.00	22.04	.....	.....	.....	.....	.....	.....	.....	.....
Apothecaries Hall Co. Waterbury, Conn.										
Liberty Bone Meal	3.29	4.08	20.00	21.30	.....	13.19	.....	.....	.....	.....
Liberty Corn 2-10-2	2.00	2.48	.....	10.83	10.00	10.16	2.00	2.42	14.00	15.06
Liberty High Grade Corn 2-12-4	2.00	2.46	.....	12.87	12.00	12.09	4.00	4.56	18.00	19.11
Liberty High Grade Market Gardeners 5-8-7	5.00	5.26	.....	8.86	8.00	8.36	7.00	6.85	20.00	20.47
Liberty Market Gardeners Special 4-8-4	4.00	4.22	.....	8.67	8.00	8.00	4.00	4.13	16.00	16.35
Liberty Potato and General Crops 4-8-10	4.00	4.12	.....	8.76	8.00	8.39	10.00	10.16	22.00	22.67
Liberty Potato and Vegetable 2-8-10	2.00	2.48	.....	8.88	8.00	8.34	10.00	10.26	20.00	21.08
Liberty Special Fertilizer for Lawns, Trees, Shrubs, Flowers and Gardens	4.00	4.34	.....	12.84	4.00	9.54	.....	.....	.....	.....
Sheep Manure	2.00	2.00	1.00	2.14	.....	1.95	2.00	2.33	.....	.....
Superphosphate (Acid Phosphate)	.....	.....	.....	17.86	16.00	17.31	.....	.....	.....	.....
Tankage	7.40	9.14	3.00	9.99	.....	6.06	.....	.....	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Total Per Cent	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Atmospheric Nitrogen Corporation, Hopewell, Va.										
Arcadian Nitrate of Soda	16.00	16.23	.....	.....	.....	.....	.....	.....	.....	.....
C. E. Buell, Inc., Boston, Mass.										
Two-in-One Peat Poultry Manure	2.75	2.91	.....	2.24	2.50	**1.94**	1.25	1.78	.....	.....
Burlington Rendering Co., Burlington, Vt.										
Burlington 3-10-4 Fertilizer	3.00	3.05	.....	10.88	10.00	10.50	4.00	3.88	17.00	17.43
Burlington 4-8-4 Fertilizer	4.00	4.30	.....	9.41	8.00	8.92	4.00	4.02	16.00	17.24
Burlington 4-8-7 Fertilizer	4.00	4.05	.....	9.19	8.00	8.69	7.00	7.00	19.00	19.74
Burlington 4-8-10 Fertilizer	4.00	**3.73**	.....	8.96	8.00	8.56	10.00	**9.10**	22.00	**21.39**
Burlington 7-6-6 Fertilizer	7.00	6.96	.....	6.58	6.00	6.44	6.00	6.00	19.00	19.40

CONSOLIDATED RENDERING CO. BOSTON, MASS.										
Corenco 8-16-14 Two in One	8.00	8.14	.....	16.52	16.00	16.00	14.00	14.13	38.00	38.27
Corenco Sheep Manure	1.23	2.06	0.50	2.68	.....	2.53	2.00	2.34	.....	.....
Ground Bone	2.05	3.08	22.90	23.95	.....	15.83	.....	.....	.....	.....
New England 8-6-2 Putting Green Special	8.00	8.13	.....	7.08	6.00	6.86	2.00	2.26	16.00	17.25
Sulphate of Ammonia	20.50	20.86	.....	.....	.....	.....	.....	.....	.....	.....
Superphosphate	.....	.....	.....	17.69	16.00	17.07	.....	.....	.....	.....
EASTERN STATES FARMERS' EXCHANGE SPRINGFIELD, MASS.										
Eastern States 4-8-8 Open Formula Fertilizer	4.00	4.45	.....	8.76	8.00	8.39	8.00	8.98	20.00	21.82
Eastern States 4-10-6 Open Formula Fertilizer	4.00	4.41	.....	10.71	10.00	10.50	6.00	7.20	20.00	22.11
Eastern States 4-12-4 Open Formula Fertilizer	4.00	4.30	.....	13.17	12.00	12.61	4.00	4.32	20.00	21.23
Eastern States 6-8-6 Open Formula Fertilizer	6.00	6.38	.....	9.02	8.00	8.58	6.00	6.61	20.00	21.57
Eastern States 8-16-16 Open Formula Fertilizer	8.00	8.23	.....	17.62	16.00	17.32	16.00	16.90	40.00	42.45
Eastern States 8-24-8 Open Formula Fertilizer	8.00	8.68	.....	25.32	24.00	24.89	8.00	9.65	40.00	43.22
Eastern States 15-20-15 Open Formula Fertilizer	15.00	15.02	.....	20.20	20.00	20.17	15.00	15.00	50.00	50.19
Eastern States 16% Superphosphate	.....	.....	16.50	16.60	16.00	16.00	.....	.....	.....	.....
Eastern States 18-6-6 Open Formula Fertilizer	18.00	**17.58**	.....	7.07	6.00	7.07	6.00	7.03	30.00	31.68
ESSEX FERTILIZER CO. BOSTON, MASS.										
Essex 2-10-2 AI Super	2.00	2.41	.....	11.22	10.00	10.68	2.00	2.04	14.00	15.13
Essex 3-10-4 Fish Brand Fertilizer for All Crops	3.00	3.29	.....	11.28	10.00	10.87	4.00	3.77	17.00	17.93
Essex 4-8-4 Market Garden	4.00	4.15	.....	8.56	8.00	8.16	4.00	4.00	16.00	16.31
Essex 4-8-10 Peerless Potato Manure	4.00	4.06	.....	9.31	8.00	8.78	10.00	10.00	22.00	22.84
Essex 5-8-7 Complete Manure	5.00	5.28	.....	9.10	8.00	8.58	7.00	6.71	20.00	20.57

	Nitrogen		Phosphoric Acid				Potash		Total Per Cent	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
International Agricultural Corporation Woburn, Mass.										
International 4-8-4	4.00	4.00	.....	8.54	8.00	8.36	4.00	4.40	16.00	16.76
International 4-8-10	4.00	4.09	.....	9.01	8.00	8.77	10.00	9.62	22.00	22.48
International 5-8-7	5.00	4.88	.....	8.85	8.00	8.67	7.00	6.79	20.00	20.34
International 7-6-6	7.00	**6.36**	.....	6.84	6.00	6.68	6.00	6.48	19.00	19.52
International 8-16-14	8.00	8.08	.....	17.67	16.00	17.37	14.00	14.15	38.00	39.60
International Caribee Sheep Manure	1.02	1.56	.....	1.16	0.50	1.08	2.00	2.02	.....	.....
Lowell Fertilizer Co. Boston, Mass.										
Lowell 2-10-2 Bone Brand	2.00	2.32	.....	10.56	10.00	10.04	2.00	2.29	14.00	14.65
Lowell 3-10-4 Animal Brand	3.00	3.12	.....	11.08	10.00	10.56	4.00	4.05	17.00	17.73
Lowell 4-8-4 Corn and Vegetable	4.00	4.20	.....	8.88	8.00	8.32	4.00	4.07	16.00	16.59
Lowell 4-8-7 Old General Crop Manure	4.00	4.00	.....	9.06	8.00	8.63	7.00	7.03	19.00	19.66
Lowell 4-8-10 Potato Grower	4.00	4.02	.....	8.61	8.00	8.22	10.00	10.29	22.00	22.53
Lowell 5-8-7 Market Garden Manure	5.00	5.14	.....	9.07	8.00	8.60	7.00	7.00	20.00	20.74

MERRIMACK FARMERS' EXCHANGE, CONCORD, N. H.										
Merrimack Brand 2-10-2	2.00	2.21	.....	10.90	10.00	10.36	2.00	2.16	14.00	14.73
Merrimack Brand 3-10-4	3.00	3.12	.....	10.69	10.00	10.22	4.00	3.69	17.00	17.03
Merrimack Brand 4-8-4	4.00	4.26	.....	9.13	8.00	8.70	4.00	4.02	16.00	16.98
Merrimack Brand 4-8-7	4.00	4.00	.....	8.82	8.00	8.48	7.00	6.90	19.00	19.38
Merrimack Brand 4-8-10	4.00	4.09	.....	8.98	8.00	8.49	10.00	10.39	22.00	22.97
Merrimack Brand 5-8-7	5.00	5.06	.....	8.85	8.00	8.55	7.00	6.85	20.00	20.46
Merrimack Brand 5-16-7	5.00	5.00	.....	16.36	16.00	**15.19**	7.00	7.14	28.00	**27.33**
Merrimack Brand 7-6-6 Top Dressing	7.00	7.62	.....	6.24	6.00	6.17	6.00	5.65	19.00	19.44
Merrimack Brand 7-8-5 Complete Fruit	7.00	**6.69**	.....	9.25	8.00	8.71	5.00	5.03	20.00	20.43
NATURAL GUANO CO., AURORA, ILL.										
Sheep Head Brand Pulverized Sheep Manure	2.00	2.50	.....	1.29	1.00	1.06	2.00	2.54	.....	.....
NEW ENGLAND FERTILIZER CO., BOSTON, MASS.										
New England 4-8-4 Potato and Vegetable Manure	4.00	4.07	.....	8.78	8.00	8.30	4.00	4.14	16.00	16.51
New England 4-8-10 Complete Manure	4.00	4.12	.....	8.61	8.00	8.17	10.00	10.00	22.00	22.29
OLDS & WHIPPLE, INC., HARTFORD, CONN.										
Luxura Plant Food	5.00	5.35	.....	11.44	8.00	9.54	6.00	6.59	19.00	21.48

	Nitrogen		Phosphoric Acid				Potash		Total Per Cent	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Portland Rendering Co. Portland, Me.										
Portland Organic Fertilizer 4-8-4	4.00	4.03	.....	8.79	8.00	8.36	4.00	4.00	16.00	16.39
Portland Organic Fertilizer 4-8-7	4.00	4.09	.....	8.76	8.00	8.40	7.00	7.09	19.00	19.58
Portland Organic Fertilizer 4-8-10	4.00	4.12	.....	8.39	8.00	8.09	10.00	10.26	22.00	22.47
Portland Organic Fertilizer 5-8-7	5.00	5.00	.....	9.02	8.00	8.57	7.00	7.13	20.00	20.70
Pulverized Manure Co. Chicago, Ill.										
Wizard Brand Cattle Manure	2.00	2.16	.....	1.22	1.00	1.04	1.00	1.70	.....	.....
John Reardon & Sons Co. Cambridge, Mass.										
Ground Bone	2.47	3.73	22.88	23.52	.....	14.77	.....	.....	.....	.....

ROGERS & HUBBARD CO. PORTLAND, CONN.										
H 4-8-4	4.00	4.21	.....	8.80	8.00	8.18	4.00	4.20	16.00	16.59
H 4-8-10	4.00	4.27	.....	9.05	8.00	8.45	10.00	**8.04**	22.00	**20.76**
H 5-8-7	5.00	5.19	.....	8.79	8.00	8.01	7.00	6.84	20.00	20.04
Hubbard's All Soils All Crops Fertilizer 4-8-4	4.00	4.19	.....	9.26	8.00	8.94	4.00	4.00	16.00	17.13
Hubbard's Corn and Grain Fertilizer 2-12-4	2.00	2.19	.....	12.70	12.00	11.81	4.00	4.10	18.00	18.10
Hubbard's Potato Fertilizer 5-8-7	5.00	5.00	.....	9.28	8.00	8.20	7.00	7.00	20.00	20.20
Oats and Top Dressing	8.00	8.02	8.00	9.05	5.00	7.18	8.00	8.00	21.00	23.20
Sheep and Goat Manure	1.35	1.48	.....	0.91	0.75	0.80	3.75	3.75	.....	.....
Soluble Potato Manure	5.00	5.36	10.00	10.10	8.00	8.02	7.00	7.09	20.00	20.47
Superphosphate	.....	.....	.....	17.86	16.00	17.37	.....	.....	.....	.....
SWIFT & CO. BALTIMORE, MD.										
Vigoro for Lawns, Gardens, Flowers, Shrubbery, Trees	4.00	4.05	.....	13.11	12.00	12.43	4.00	4.24	20.00	20.72
TENNESSEE CORPORATION NEW YORK, N. Y.										
Loma	5.00	5.03	.....	11.07	10.00	10.27	4.00	4.04	19.00	19.34
Soil-Prep 4-2-2	4.00	4.44	.....	2.46	2.00	2.00	2.00	2.11	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Total Per Cent	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Virginia-Carolina Chemical Corp. Baltimore, Md.										
Aroostook Potato Grower 5-8-7	5.00	5.19	.....	8.72	8.00	8.40	7.00	7.32	20.00	20.91
Owl Brand Fertilizer 2-12-4	2.00	2.00	.....	12.62	12.00	12.02	4.00	3.79	18.00	17.81
Sheep Manure	1.65	2.07	0.75	1.85	.....	1.71	1.50	1.78	.....	.....
Walker-Gordon Farms Juliustown, N. J.										
Driconure 1-1-1	1.00	1.84	1.00	0.87	.....	0.71	1.00	1.58	.....	.....

PAS
630.72
N532
no. 272-284